REMARKS

This Amendment is filed in response to the FINAL Office Action mailed July 18, 2005, and with the Request for Continuing Examination filed on the date herewith. Applicant submits that the present Amendment does not generate any new matter. All objections and rejections are respectfully traversed.

Claims 1 to 53 are in the application and currently pending.

Claims 24, 26, 29 are amended to better claim the invention.

Claim 31 to 53 are added to better claim the invention.

Rejections Under 35 U.S.C. §102

At paragraph 1 of the Office Action, claims 8-15, 17-19, and 22-23 were rejected under 35 U.S.C. §102(e) as being anticipated by Lyon et al., US Patent No. 6,333,917 issued on December 25, 2001, hereinafter Lyon.

The present invention, as set forth in representative claim 8, comprises in part:

8. A policer based on Random Early Detection (RED), comprising:
      means for determining a moving average of a virtual time debt; and
      means for *determining whether a packet should be dropped based on* a value of the moving average of *the virtual time debt*.

Lyon discloses a Random Early Detection (RED) method which marks packets as an indication of congestion. (Col. 6 lines 20-34; Col. 12 lines 57-63; Col. 16 lines 18-29). The marked packets, also referenced to as tagged packets, are used as feedback to a source to control the source transmission rate. (Col. 6 lines 28-34). Control of the source

transmission rate may be by (1) dropping packets and using the lack of an ACK, (2) transmitting the mark to the source, etc.

Applicant respectfully urges that Lyon is silent concerning Applicant's claimed novel *virtual time debt* for a means for determining whether a packet should be dropped based on a value of the moving average of the *virtual time debt*. That is Lyon is totally silent concerning Applicant's *virtual time debt*.

At paragraph 8 of the Office Action, the examiner argues:

> "Applicants argue that Lyon (US 6,333,917) does not disclose the limitations of claim 8, because Lyon does not discloses 'determining whether a packet should be dropped based on ...the virtual time debt." (Emphasis removed). Applicants further argue, that because Lyon does not teach, "using a virtual time debt calculation when determining which packet to drop. By calculating the delay from the expected jacket arrival time to the actual packet arrival time." Examiner notes that claim 8 does not specify that the virtual time debt is determined by "calculating the delay from the expected arrival time to the actual packet arrival time," and the claimed subject matter can be broadly interpreted as being taught by Lyon. More specifically claim 8 recites: A policer based on Random Early Detection (RED) comprising:
> means for determining a moving average of a virtual time debt; and
> means for determining whether a packet should be dropped based on a value of the moving virtual time debt.
> Lyon discloses a RED+ engine (policer based on Random Early Detection (RED)) that determined a moving average of an AVR-TIME, the AVR-TIME is equated as being the claimed "virtual time debt", because the claimed 'virtual time debt", does not specify the alleged "the delay from the expected packet arrival time to the actual packet arrival time." In addition Lyon discloses dropping a packet based on congestion of the queue, and since the queue congestion is proportional to the AVR-TIME it can be regarded as the claimed determining whether a packet should be based on a value of the moving average of the virtual time debt. See Lyon column 16, lines 45-65."

An inventor is his own lexicographer, "A virtual time debt for each packet is a difference between the real time of a packet arrival and the theoretical (virtual) time the

packet should have arrived." (Spec. Page 5 lines 9-11). Based on this definition, Lyon is silent concerning a virtual time debt.

Applicant respectfully urges that the Lyon patent is legally precluded from anticipating the claimed invention under 35 U.S.C. § 102 because of the absence from the Lyon patent of Applicant's claimed novel *"determining whether a packet should be dropped based on … the virtual time debt."*

At paragraph 2 of the Office Action, claims 24-26 and 29-30 were rejected under 35 U.S.C. §102(e) as being anticipated by Gracon et al., US Application Publication No. 2002/0110134, published on August 15, 2002, hereinafter Gracon.

The present invention, as set forth in representative claim 24, comprises in part:

24. A method of policing packets in a network device, the method comprising the steps of:

determining a virtual time debt of packets flowing through the network device, *the virtual time debt computed as a positive delay from an expected packet arrival time established by a traffic contract to an actual packet arrival time*;

determining that packets should be dropped when the virtual time debt of the packets exceeds a predetermined value; and if so

choosing a packet to be dropped, the chosen packet in response to a random number; and

dropping the chosen packet.

As stated in the previous Amendment filed, Gracon discloses a system for scheduling packets in a broadband data stream. Gracon uses a policer to assign a priority to each packet received, and based on congestion levels, a congestion manager determines whether to send the packet based on the priority. Gracon detects a congestion level using standard methods, such as by monitoring the "fullness" of a queue. The policer in Gracon utilizes a theoretical arrival time (TAT) and an arrival time (Ta) to determine whether

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a packet is non-conforming to a specified maximum information rate (MIR). In particular, Gracon drops packets if the Ta of a packet plus a delay tolerance (L) is less than the TAT. That is, if the packet arrives <u>sooner</u> than it is expected, Gracon drops the packet as being transmitted at a rate greater than the MIR. Also, if the packet arrives (at Ta) later than the TAT, Gracon <u>adjusts</u> the TAT to equal the Ta.

Applicant respectfully urges that Gracon does not show Applicant's claimed novel *"the virtual time debt computed as a positive delay from an expected packet arrival time established by a traffic contract to an actual packet arrival time."*

Applicant's claimed invention is directed toward a policer that uses a virtual time debt calculation when determining which packets to drop, as described above. By calculating the delay from the expected packet arrival time to the actual packet arrival time, it can be determined if the system has too many packets currently traveling over the network, in which case a random number is generated for use in dropping packets. In other words, if a packet arrives <u>later</u> than it is expected, the packet has been delayed due to congestion, and has a virtual time debt. A delay due to congestion is a positive delay. In contrast, Gracon does not drop packets that arrive <u>later</u> than expected as an indication of congestion, but instead detects congestion in a typical "filled-queue" manner, and drops packets that arrive <u>sooner</u> than expected as packets that are non-conforming to a service agreement, i.e., are sending packets at a higher rate than allowed. Also, as evidenced by the <u>adjustment</u> of the TAT with the Ta of a conforming packet, Gracon, unlike Applicant's claimed invention, appears to accept and support the slower arrival of packets.

Also, Gracon's TAT and Ta are used to solve a different problem than Applicant. Namely, Gracon addresses the problem of a particular sender sending too many packets during a certain period of time, a threshold as specified by a service agreement (e.g., as the maximum information rate, MIR). If a packet arrives at a faster rate than is expected, it is dropped. Applicant, on the hand, addresses the problem of congested networks, where if a packet arrives at a slower rate than is expected, it has been subject to congestion, and is to be dropped.

Applicant respectfully urges that the Gracon patent is legally precluded from anticipating the claimed invention under 35 U.S.C. § 102 because of the absence from the Gracon patent of Applicant's claimed novel *"the virtual time debt computed as a positive delay from an expected packet arrival time established by a traffic contract to an actual packet arrival time."*

Rejections Under 35 U.S.C. §103

At paragraph 3 of the Office Action, claims 1 and 5-7 were rejected under 35 U.S.C. §103(a) as being unpatentable over Silberschatz et al., US Patent No. 6,556,578, issued on April 29, 2003, hereinafter Silberschatz, in view of Lyon.

As stated in the previous Amendment filed, Silberschatz discloses a system for managing a buffer pool containing a plurality of queues that determines when to drop a packet, and from which queue the packet should be dropped. Silberschatz determines a **global average queue occupancy**, *"avg,"* of the plurality of queues, and uses this to compute a packet dropping algorithm. If *avg* is above a maximum threshold, packets are dropped from the buffer queues, and if *avg* is above a minimum threshold, the system determines a probability for dropping packets. The system in Silberschatz can determine if one of the plurality of queues is the "offender" from which the packets should be dropped in order to lower the global average, *avg*.

Examiner also notes that "the difference between Silberschatz teaching and the limitations of claim 1, is that ... the dropping of packet is based on time variable and not the buffer occupancy."

For the reasons set forth above with respect to representative claim 8, Applicant respectfully urges that the Silberschatz patent and the Lyon patent, either taken singly or in combination, are legally insufficient to render the presently claimed invention obvious

under 35 U.S.C. § 103 because of the absence of Applicant's claimed novel *"determining whether a packet should be dropped based on ... the virtual time debt."*

At paragraph 5 of the Office Action, claims 16 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lyon, in view of Subramaniam et al., US Patent No. 6,640,302, issued on October 28, 2003, hereinafter Subramaniam.

Subramaniam discloses a computer network that is secured, and in which a target server located within the secured network is accessed by client machine outside perimeter secured network. For the reasons set forth above with respect to representative claim 8, Applicant respectfully urges that the Lyon patent and the Subramaniam patent, either taken singly or in combination, are legally insufficient to render the presently claimed invention obvious under 35 U.S.C. § 103 because of the absence of Applicant's claimed novel *"determining whether a packet should be dropped based on ... the virtual time debt."*

At paragraph 7 of the Office Action, claim 27 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lyon.

For the reasons set forth above with respect to representative claim 8, Applicant respectfully urges that the Lyon patent is legally insufficient to render the presently claimed invention obvious under 35 U.S.C. § 103 because of the absence of Applicant's claimed novel *"determining whether a packet should be dropped based on ... the virtual time debt."*

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At paragraph 4 of the Office Action, claims 2-4 were rejected under 35 U.S.C. §103(a) as being unpatentable over Silberschatz in view of Lyon, and further view of Fahmi et al. US Patent No. 6,108,303, issued on August 22, 2000, hereinafter Fahmi.

At paragraph 6 of the Office Action, claims 20 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lyon, in view of Fahmi.

Applicant respectfully notes that claims 2-4 and 20-21 are dependent claims that depend from independent claims which are believed to be in condition for allowance. Accordingly claims 2-4 and 20-21 are believed to be in condition for allowance.

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims, and therefore in condition for allowance.

Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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